

Abstract of the Disclosure

A system and method for computer-aided engineering analysis using direct mesh manipulation of a mesh model is provided. The system includes a computer system having a memory, a processor, a user input device and a display device. The method includes the steps of selecting a geometric model in a computer-aided design (CAD) format, converting the CAD model into a mesh model and evaluating the mesh model using a computer-aided engineering (CAE) analysis. The method also includes the steps of modifying a surface of the mesh model by varying a predetermined parameter using direct surface manipulation (DSM), updating the mesh model and using the updated mesh model in further CAE analysis. Three techniques are provided for modifying a surface feature, including using a Dirichlet parameter distribution to determine the displacement of the surface feature; modeling the surface feature as an elastic sheet to determine deformation; and enclosing the feature within a lattice structure and using lattice deformation to determine surface deformation.